

DEVICE FOR THE MOUNTING OF FLEXIBLE SPACERS

The invention relates to a device for the mounting of prefabricated flexible spacers to a glass pane during the course of the manufacture of insulating glass, with a lateral support for substantially vertically disposed glass panes, a conveying means for feeding the glass panes, and with a tool for attaching the spacer, this tool being movable relatively to the glass pane, wherein the tool is displaceable upwards and downwards by way of a slide on a substantially vertically disposed guide rail, and with a supply station for the spacer exhibiting a feed reel for the spacer.

Such devices have been known from European Laid-Open Applications Nos. 0 152 807 and 0 171 309; in the last-mentioned application, the spacer is molded, at the instant of mounting, from a plastic, rubbery mass (butyl rubber).

Spacers for insulating glass that can be mounted with the aid of the device according to this invention have been described, for example, in DOS No. 3,002,904 or in U.S. Pat. No. 3,427,776, and are also called "swiggle strip".

The device known from European Laid-Open Application No. 0 152 807 comprises a substantially fixedly arranged unit for pressing the spacer onto a glass pane that is traveling through; in this procedure, the glass pane must be turned by 90° as soon as the unit for pressing the spacer in place has arrived at a corner.

In the device according to European Laid-Open Application No. 0 171 309, an injection head with which the rubbery, plastic composition is molded into a strip applied to the glass pane is moved vertically upwards and downwards so that, by combined movements of the injection head and of the glass pane, synthetic resin skeins that extend all around can be applied by molding.

The invention is based on the object of providing a device of the type discussed hereinabove which makes it possible to apply prefabricated, flexible spacers to a glass pane without any problems, the turning of the glass pane by 90° being avoided and yet it being possible to mount a prefabricated spacer as in European Laid-Open Application No. 0 152 807.

The invention, in attaining this object, is characterized in that the tool is rotatable at the slide about an axis oriented essentially perpendicularly to the lateral support for the glass panes, and can be moved forwards and backwards in the direction of this axis, the spacer being guided through a hollow-configured shaft of the tool to an attaching head of the latter.

Owing to the structure according to the invention, the pivoting of the glass pane to which the spacer is to be attached, constituting a disadvantageous feature in European Laid-Open Application No. 0 152 807, can be eliminated. Since moreover the spacer is fed through a hollow-designed shaft of the tool, no problems whatever are encountered during turning of the tool by 90° together with the attachment head provided at the tool in the region of a corner of the glass pane to which the spacer is to be attached.

The embodiments emphasized as inventive in claims 2-16 bring about an especially simple and unproblematic guidance of the spacer in the zone of the tool wherein additionally the driven conveyor belts advancing the spacer toward the glass pane, as known from

European Laid-Open Application No. 0 152 807, can be omitted.

The movements of the tool and of the attaching head driven thereby are made especially simple if the device of the invention exhibits the features of claims 17-22.

The features emphasized as pertaining to the invention in dependent claims 23-30 result in an especially unproblematic feeding of the spacer, to be attached, to the tool and in a simple and yet effective regulation of the drive mechanism for the take-off reel.

In dependent claims 31-35, features of the invention are emphasized providing an especially favorable and safe arrangement for a particularly simple and reliable movement of the glass panes while they are being supplied and during the motions while the spacer is applied, which latter is pushed by the relative motion between the glass pane and the attaching head through the tool.

The embodiment of a device for applying flexible spacers to a glass pane as characterized in independent claims 39-42 ensures that the temperature range (about 10-15° C.) favorable for the processing of such spacers can be maintained independently of the surrounding temperature.

Additional features and details of the invention can be seen from the following description of the embodiments illustrated in the drawings, in part schematically. In the drawings:

FIG. 1 shows, in a perspective view, the entire device,

FIGS. 2, 3 and 4 show details of the tool with the attaching head,

FIG. 5 shows the supply station,

FIG. 6A shows an embodiment with a thermally insulating housing; and

FIG. 6B is a fragmentary view taken in the direction of the arrow X in FIG. 6A.

The arrangement illustrated in FIG. 1 comprises the actual device 1 for mounting a spacer 2 to a glass pane 3 and a supply station 4 for the spacer 2, set up beside the device 1.

As can be seen from FIG. 1, the device 1 comprises a machine frame 5 resting on the floor by way of feet 6. The machine frame carries a support inclined rearwardly by a few degrees, for example 6°-8°, designed as a supporting wall 7; in the illustrated example, the supporting wall 7 is fashioned as an air cushion wall with outlet orifices 8 for compressed air.

A horizontal conveyor 9, 10 consisting of two segments is provided at the lower end of the supporting wall 7. An entraining means 11, fashioned, for example, as a vacuum suction element, is provided between the lower rim of the supporting wall 1 and the horizontal conveyor 9, 10, the entraining means 11 being slidable to and fro on guides 13 by means of a drive mechanism, not illustrated in detail, for the to and fro movement of the glass pane 3 in the direction of the double arrow 12. The entraining means 11 and, respectively, its slide 14 guided along the guides 13 can advantageously be coupled with the horizontal conveyor 9, 10 to ensure an absolutely synchronous movement between the two conveyors.

A supporting roll 15 for the glass pane 3 is additionally provided in the supporting wall 7; this roll is rotatable about an axis extending in parallel to the supporting wall 7 and lying in a vertical plane. A drive mechanism can be associated with the supporting roll 15 for driving the latter, the peripheral velocity of the supporting roll